Release notes for ENDF/B Development n-001_H_001 evaluation

April 26, 2017

- `fizcon` Warnings:

  1. 2-body MT102 OK for 1H: 1H(n,g)2H
     MAT= 125, MF= 6, MT=102 (1): Is 2-body rxn.

     ```
     ERROR(S) FOUND IN MAT= 125, MF= 6, MT=102
        DISCRETE 2-BODY LAW NOT PERMITTED FOR MT= 102
     ```

  2. 2-body MT102 OK for 1H: 1H(n,g)2H
     MAT= 125, MF= 6, MT=102 (2): Is 2-body rxn.

     ```
     ERROR(S) FOUND IN MAT= 125, MF= 6, MT=102
     No problems to report
     ```

- `fudge-4.0` Warnings:

  1. Cross sections do not approach saturation of Wick's limit
     reactionSuite: (Error # 0): Wick's limit

     ```
     WARNING: Wick's limit too low by 1.672% at 950000.0
     WARNING: Wick's limit too low by 4.008% at 1000000.0
     WARNING: Wick's limit too low by 8.190% at 1100000.0
     WARNING: Wick's limit too low by 11.832% at 1200000.0
             ... plus 59 more instances of this message
     ```

  2. Found an invalid distribution for this type of reaction
     reaction label 1: H2 + photon / Product: photon / Distribution: (Error # 0): Invalid dist.

     ```
     WARNING: uncorrelated is not a valid distribution component for 2-body reaction
     ```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.59%
     ```

  4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
     Section 2 (H2 + photon): / Form 'eval': (Error # 0): Condition num.

     ```
     WARNING: Ratio of smallest/largest eigenvalue (2.359558e-10) is too small
     ```

- `fudge-4.0` Errors:

  1. Recoil distribution type specified, but recoil partner has unsupported distribution
     reaction label 1: H2 + photon / Product: H2 / Distribution: / angularTwoBody - recoil: (Error # 0): Bad recoil

     ```
     WARNING: Recoil distribution type specified, but recoil partner has unsupported distribution type!
     ```

- `njoy2012` Warnings:

1. This nuclide has no URR and NJOY is upset about it
   unresr...calculation of unresolved resonance cross sections (0): No URR

```
 ---message from unresr---mat  125 has no resonance parameters
                           copy as is to nout
```

2. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt102 has recoil with no spectrum
                           photon momentum recoil used.
```

3. This nuclide has no URR and NJOY is upset about it
   purr...probabalistic unresolved calculation (0): No URR

```
 ---message from purr---mat  125 has no resonance parameters
                           copy as is to nout
```

4. The evaluation was missing a file 12. This may be OK. Or not.
   acer...monte carlo neutron and photon data (1): No MF12

```
 message from gamsum---file 12 not found.
```

5. Coefficient mismatch of some sort
   covr...process covariance data (1): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt  125/  1 vs. mat1/mt1  125/  1
                           largest coefficient=  1.00000E+00 at index 539 555
```

6. The number of coefficients was too large in a covariance
   covr...process covariance data (2): Cov:Too many coeff.

```
 ---message from matshd--- 512 coefficients > 1
                           reset and continue.
```

7. Coefficient mismatch of some sort
   covr...process covariance data (3): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt  125/  1 vs. mat1/mt1  125/  2
                           largest coefficient=  1.00000E+00 at index 539 555
```

8. The number of coefficients was too large in a covariance
   covr...process covariance data (4): Cov:Too many coeff.

```
 ---message from matshd--- 512 coefficients > 1
                           reset and continue.
```

9. Coefficient mismatch of some sort
   covr...process covariance data (5): COVR/matshd (2)

```
 ---message from matshd---processing of mat/mt  125/  2 vs. mat1/mt1  125/  2
                           largest coefficient=  1.00000E+00 at index 539 555
```

10. The number of coefficients was too large in a covariance
    covr...process covariance data (6): Cov:Too many coeff.

```
 ---message from matshd--- 512 coefficients > 1
                           reset and continue.
```